
Studies on Geocalycaceae (Hepaticae). XI. Supraspecific New Taxa and New Combinations in *Chiloscyphus* Corda for Australasia

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ABSTRACT. *Chiloscyphus* sect. *Novae-zeelandii*, sect. *Semiteres*, sect. *Spiniferi*, and sect. *Hemispini* are described as new. *Chiloscyphus* subg. *Connati*, subg. *Microlophocolea*, and subg. *Cyanolophocolea* are new combinations.

The following new taxa and new combinations are the result of a systematic study of the genus *Chiloscyphus* Corda in Australasia. The names are here published separately to make them immediately available for use.

1. *Chiloscyphus* sect. *Novae-zeelandii* Engel, sect. nov. TYPE: *Jungermannia novaezeelandiae* Lehmann & Lindenberg, in Lehmann, Nov. Min. Cogn. Stirp. Pug. 6: 33. 1834.

Plantae dioicae, spicis masculis elongatis, bracteis quam foliis brevioribus, aliter velut in sect. *Heterophylli*.

Plants dioecious; branching of *Frullania*- and lateral-intercalary types or strictly lateral-intercalary; leaves with apex polymorphic, undivided and rounded to retuse to 1-lobed to shallowly bilobed, at times all or a combination of these variants on 1 shoot, the leaf margins entire or armed with 1 or more teeth; underleaves bifid to 0.4–0.85, the lamina margins 1–3 dentate-ciliate; androecia forming elongate spikes, the bracts smaller than leaves; gynoecia on main shoots or long leafy branches, never on short intercalary branches that lack leaves, never on terminal branches.

The section belongs in subgenus *Lophocolea* (Dumortier) Engel & Schuster and is restricted to Australasia.

2. *Chiloscyphus* sect. *Semiteres* Engel, sect. nov. TYPE: *Jungermannia semiteres* Lehmann, Linnaea 4: 363. 1829.

Sectio *Novae-zeelandii* similis, gynoeciis interdum in ramis brevibus aphyllis latero-intercalaribus vel ramis terminalibus vel surculis principalibus, seta cellulis magis numerosis constructis, atque pariete interno capsulae non aequaliter incrassato differt.

Plants with branching terminal-lateral and lateral-intercalary or strictly lateral-intercalary; leaves

undivided, the margins entire or dentate; underleaves 2–4-lobed at least to 0.5, at times divided nearly to the base, the lamina margins on each side with a tooth or lobule. Gynoecia often on abbreviated lateral-intercalary branches lacking normal leaves, sometimes on terminal branches or main shoots.

The section belongs in subgenus *Lophocolea*, and is pan-south temperate in distribution.

3. *Chiloscyphus* subg. *Connati* (Lindenberg) Engel, comb. nov. Basionym: *Plagiochila* sect. V. *Connatae* Lindenberg, Species Hepathicarum XXIX. 1839. *Lophocolea* subg. *Connatae* (Lindenberg) Piippo, Ann. Bot. Fenn. 131: 165. 1985. TYPE: (see Piippo, 1985: 165): *Chiloscyphus ciliolatus* (Nees) Gottsche.

4. *Chiloscyphus* sect. *Spiniferi* Engel, sect. nov. TYPE: *Chiloscyphus spiniferus* (Hooker f. & Taylor) Engel & Schuster.

Plantae dioicae. Folia ad apicem subaeque bilobata. Cellulae foliorum amphigastrorum atque perianthiorum laeves sine protuberationibus, eadem foliorum trigonis minutis. Amphigastria admodum magna, asteroidea, (4)6-lobata, anguste utrinque connata.

Plants dioecious; leaves subequally bilobed; leaf, underleaf, and perianth cells smooth, without protuberances, the leaf cells with small trigones; underleaves exceedingly large, (4–)6-lobed, narrowly connate on both sides.

The section belongs in subgenus *Connati* and is restricted to New Zealand.

5. *Chiloscyphus* subg. *Microlophocolea* (Spruce) Engel, comb. et stat nov. Basionym: *Lophocolea* sect. *Microlophocolea* Spruce, Trans. & Proc. Bot. Soc. Edinburgh 15: 426. 1885. *Lophocolea* sect. *Microlophocolea* (Spruce) Schiffner, in Engler & Prantl, Natürl. Pflanzenfam. 1 (3): 92. 1893. *Chiloscyphus* sect. *Microlophocolea* (Spruce) Engel & Schuster, Nova Hedwigia 39: 410. 1985 (1984). TYPE: *Lophocolea liebmanni* Gottsche (lectotype, fide Grolle (1976)).

6. Chiloscypus sect. **Hemispini** Engel, sect. nov. TYPE: *Chiloscypus parvispinus* Engel.

Plantae dioeciae, rami plerumque latero-intercalares interdum terminalo-laterales nunquam ventro-intercalares, folia pagina dorsali hispida ventrali laevi, lobi amphigastriorum integri vel parce (1–2) dentati.

Plants dioecious; branches mostly of lateral-intercalary type, less often of *Frullania*-type; leaves with dorsal surface hispid, the ventral surface of leaf uniformly smooth; underleaf lobes entire or at most with 1–2 teeth.

The section belongs to subgenus *Microlophocolea* and is restricted to Australasia.

7. Chiloscypus subg. **Cyanolophocolea** (Schuster) Engel, comb. et stat nov. Basionym: *Lophocolea* sect. *Cyanolophocolea* Schuster, Hep. Anthoc. N. Amer. 4: 238. 1980. *Chiloscypus* sect. *Cyanolophocolea* (Schuster) Engel & Schuster, Nova Hedwigia 39: 409. 1985 (1984). TYPE: *Lophocolea echinella* Lindenberg & Gottsche.

Subgenera and sections of Australasian *Chiloscypus* may be distinguished by the following key.

SYNOPTIC KEY TO AUSTRALASIAN SUBGENERA AND SECTIONS OF *CHILOSCYPUS*

- 1a. Dorsal (and sometimes ventral) leaf surfaces armed with conspicuous sharp-pointed laminar and marginal processes formed of 1–several cells; perianths armed on external (and often internal) surfaces with spinose cellular processes; antheridial stalk 1-seriate.
- 2a. Leaf insertion extended to stem midline dorsally; gynoecia variable in position: acrogynous or cladogynous (the cladogynous lateral- or ventral-intercalary, often or usually bearing vegetative leaves) subg. *Microlophocolea*
- 3a. Ventral surface of leaf (suboptimal plants aside) with teeth; underleaf segments with opposing teeth or cilia, the abaxial surface of both segments and lamina often with scattered teeth; ventral-intercalary branches at least sometimes present sect. *Microlophocolea*
- 3b. Ventral surface of leaf uniformly smooth; underleaf segments entire or at most with 1–2 teeth, the teeth never regularly opposing, the abaxial surface of both segments and lamina smooth; ventral-intercalary branches lacking sect. *Hemispini*
- 2b. Leaf insertion not extending to stem midline dorsally and delimiting a broad leaf free gutter 6–10 cells wide; gynoecia usually on abbreviated ventral-intercalary branches devoid of vegetative leaves subg. *Cyanolophocolea*

- 1b. Leaf surfaces smooth or armed with thick-walled tubercles; perianths smooth, never armed with spinous processes; antheridial stalk 1- or 2-seriate.
- 4a. Aspect heteroscyphoid: subopposed leaves consistently and distinctly connate with adjacent, large, conspicuous and broad underleaves, thus each gyre bearing a single, continuous, leaf-complex; innermost capsule wall cells with semiannular bands often furcate and anastomosing to delimit fenestrae; antheridial stalks biseriate subg. *Connati*
- 5a. Leaf, underleaf, and perianth cells armed on both surfaces with prominent, central, dome-like, thick-walled tuberculae one each per cell sect. *Leucophylli*
- 5b. Leaf and underleaf cells smooth, without protuberances of any sort.
- 6a. Underleaves 2–4-lobed or -lobulate, very broadly connate with lateral leaves, without conspicuous basal teeth; leaf cells with nodose trigones sect. *Connati*
- 6b. Underleaves (4–)6-lobed and with basal accessory teeth, narrowly connate with lateral leaves; leaf cells with small trigones sect. *Spiniferi*
- 4b. Aspect chiloscypoid: leaves usually clearly alternate, never conspicuously united with underleaves to form solitary ring-like units, the underleaves free or narrowly connate with leaves on one side (or if consistently narrowly connate on both sides, then connation obscure); innermost capsule wall cells with complete to incomplete to spur-like tangential thickenings that fail to fork or fork only sporadically and do not delimit fenestrae; antheridial stalks 1-seriate.
- 7a. Underleaves undivided and entire or at most bifid to 0.3, the lamina margins at most with 1 tooth on each side; ventral-intercalary branching common; leaves oriented subtransverse to subsuccubous, very rarely strongly succubous, the insertion strongly recurved at ventral end, distinctly inverted J-shaped subg. *Notholophocolea*
- 7b. Underleaves bifid to 0.4 or more, the lamina margins often with 2–3 teeth or a laciniiform to lobuliform process on each side; ventral-intercalary branching rare or lacking; leaf orientation strongly succubous, the insertion not or hardly recurved at ventral end, at most weakly inverted J-shaped subg. *Lophocolea*
- 8a. Leaves fundamentally undivided, the apices on a single shoot at times variable and then rounded to 1- to 2-lobed, but never consistently bilobed.
- 9a. Gynoecial position variable, some to many on short, lateral-intercalary branches lacking normal leaves (others on leading leafy shoots), at times on terminal branches; leaf apices

broadly rounded to retuse or occasionally short bifid, not polymorphic, the shoots without a combination of undivided, 1- and 2-lobed leaves; perianth wings sporadic or lacking; inner layer of capsule wall cells with radial walls devoid of continuous sheets of pigmented thickening; seta 8–11 cells diam., with 26–30 epidermal cell rows; gemmae lacking sect. *Semiteres*

- 9b. Gynoecia on main shoots or long leafy branches, never on short intercalary branches that lack vegetative leaves, never on terminal branches; leaf apices often polymorphic, the shoots with a combination of undivided, 1- and 2-lobed leaves; peri-

anth wings rather common; inner layer of capsule wall cells with continuous sheets of pigmented thickening on vertical radial walls; seta (where known) 6–8 cells diam., with 17–21 epidermal cell rows; gemmae frequent sect. *Novae-zeelandii*

- 8b. Leaves fundamentally bilobed
 sect. *Lophocolea*

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